U.S. Deportment
of Transportation
Federal Aviation
Administration

Advisory Circular

Subject: DOORS BETWEEN PILOT' S COMPARTMENT AND PASSENGER CABIN IN SMALL AIRPLANES

Date: 9/22/83
Initiated **by:** ACE-100

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Change:

1. PURPOSE. This advisory circular sets forth acceptable means, but not the only means, of showing compliance with Part 3 of the Civil Air Regulations (CAR) and Part 23 of the Federal Aviation Regulations (FAR) applicable to a door between pilot's compartment and passenger cabin in small airplanes.

2. RELATED REGULATIONS. For convenience, the related sections of CAR, Part 3 reference, corresponding to the sections of FAR, Part 23, are shown in parentheses.

a. Section 23.807 (3.387).

b. Section 23.561 (3.386).

c. Section 23.773 (3.382).

d. Section 23.1557 (3.768).

3 RELATED READING MATERIAL. Proposed Technical Assistance and Guidance letter, CAR 3.387(c) and FAR 23.807(a)(3), dated September 8, 1981, is withdrawn.

4 BACKGROUND. In accordance with airworthiness regulations, if the pilot's compartment is separated from the passenger cabin by a door that is likely to block the pilot's escape in a minor crash landing, there must be an exit in the pilot's compartment. For airplanes that do not have any other exits in the pilot's compartment, questions were raised pertaining to a door that would not be likely to block the pilot's escape. Curtains were used in the past, but recently several small airplanes presented for type certification had frangible doors or rigid doors between the pilot's compartment and cabin. This advisory circular provides two methods of showing compliance with airworthiness regulations where the door(s) would not block the pilot's escape in a minor crash landing.

5. APPLICATION. This guidance material is applicable for new, amended, and supplemental type certificates, and alterations that affect the doors between pilot's compartment and passenger cabin.

6. ACCEPTABLE MEANS OF COMPLIANCE. Curtains suspended from a rod at the top and made of flexible material, such as cloth or vinyl without slats on the sides, top, or bottom, are considered to be doors of the type that will not block the pilot's escape. Doors or folding doors with rigid-frangible materials may jam in a minor crash landing and block the pilot's escape. Acceptance of frangible doors can be shown by the evacuation procedure in paragraph 6a or by the conditions for acceptance

of rigid doors in paragraph 6b. Rigid doors with stiff members that are not frangible may jam in a minor crash landing. These doors are only acceptable by placarding the doors to be latched in an open position for takeoff and landing, providing the conditions prescribed in paragraph 6b are in compliance.

a. Acceptance of Frangible Doors. The purpose of the test is to demonstrate that the door between the pilot's compartment and the passenger cabin will not block the pilot's escape in the event the door is jammed. Acceptable means of showing compliance is by demonstrating that the door is frangible and the flight crew participants can egress from the airplane without assistance within the 90-second time limit.

(1) The test should be conducted in an airplane, or a mockup if it conforms to the production airplane's interior configuration, containing a bulkhead and door to be tested. The door must be closed to simulate jamming. If the fragments from the broken door could cause an obstruction to the escape routes with the passenger emergency egress, and if an emergency evacuation demonstration is required by airworthiness regulations or operating rules, consideration should be given to include the passengers in the test, For emergency evacuation demonstrations with passengers, refer to applicable regulations and guidance materials.

(2) Two participants representing a pilot in the left crew seat and a copilot in the right crew seat will be used for the test. They should be persons with no special escape abilities. The approximate stature and weight variables for the crew members should be a female 60 inches tall and weighing 102 pounds and a male 74 inches tall and weighing 210 pounds. The foregoing stature and weights represent the 5 and 95 percentiles respectively. The female participant will be instructed to break the door and be the first person to egress without assistance from the male participant. Instructions for enhancing the egress should be limited to those instructions that will be provided in the FAA-approved Airplane Flight Manual (AFM) and/or on the related placards.

(3) Determine that the lighting simulates the night lighting conditions, that is, no moonlight or starlight will exist during the test. Lighting may be allowed at ground level to aid in leaving the area near the airplane providing the lighting is kept low and shielded so it does not aid in evacuating the airplane.

(4) Personnel participating should be informed of the purpose of the demonstration and of the safety precautions. Safety of participants is the responsibility of the applicant, and should be considered to prevent injuries to the participants without compromising the test results. Participants may wear protective gear such as crash helmets, but the protective gear, tools, or any other device should not be used to break through the door.

(5) The time limit for the emergency evacuation is 90 seconds for both crew members and passengers, whether or not the passengers are required to participate in the demonstration.

(6) Information advising the flight crew members that the door(s) are frangible should be placarded on the door(s) and noted in the "Limitation Section" of the AFM.

b Acceptance of Rigid Doors. One method of showing compliance with rigid doors with stiff members that may jam in a minor crash landing is placarding the doors to be latched in an open position for takeoff and landing, providing the following conditions are met:

(1) The opening and latching of the door should be included in the "Normal Procedure Section" under the "Before Takeoff" and "Before Landing" checklists of the AFM.

(2) With the door latched in the fully open position, the latch should be able to withstand the load exerted upon it when the door is subjected to the ultimate forces relative to the surrounding structure, as listed in section 23.561.

(3) Opening and latching the door is considered a necessary flight operation; therefore, the flight crew members should be able to open and latch the door with the safety belt and shoulder harness fastened, if required by airworthiness regulations or operating rules.

(4) If certification of night operation is requested, the pilot compartment with the door(s) opened should be free from glare and reflections that could interfere with the pilot's vision in accordance with section 23.773.

(5) The doors should be placarded in accordance with section 23.1557, and the placard should state the doors are to be latched in an open position before takeoff and before landing. Placard information should be in the "Limitation Section" of the AFM.

/s/ MURRAY E. SMITH
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